

Chapter 9

Hazards and Hazardous Materials and Waste

9.1 Affected Environment

This chapter describes the affected environment related to hazards and hazardous materials for the dam and reservoir modifications proposed under SLWRI.

Because of the potential influence of the proposed modification of Shasta Dam and water deliveries over a rather large geographic area, the SLWRI includes both a primary study area and an extended study area. The primary study area has been further divided into Shasta Lake and vicinity and upper Sacramento River (Shasta Dam to Red Bluff). The extended study area has been further divided into the lower Sacramento River and Delta and CVP/SWP service areas.

This section describes hazards and hazardous materials, defined as hazardous waste and hazardous substances, in the primary and extended study areas. The discussion of hazards focuses primarily on wildland fire and its related effects on the human environment and natural resources, and water safety hazards, particularly those related to Shasta Lake. Other relevant hazards, such as flooding, dam failure, and issues related to hydropower generation, public services (e.g., fire protection, law enforcement, emergency services), roadways and bridges, and recreation, are addressed in separate chapters. The effects of proposed fuels treatments, such as pile burning, on air quality are addressed in Chapter 5, “Air Quality.”

The hazards and hazardous waste setting for the primary study area consists of the portion of Shasta County above Shasta Dam and the upper Sacramento River from the dam downstream to the Red Bluff Diversion Dam, including the lands within the boundary of the Shasta Unit of the Whiskeytown-Shasta-Trinity National Recreation Area (NRA). This area encompasses parts of the Pit River, Squaw Creek, McCloud River, and Sacramento River watersheds. The hazards and hazardous waste setting for the upper Sacramento River portion of the primary study area consists of lands draining to the Sacramento River between Shasta Dam and Red Bluff.

The hazards and hazardous waste setting for the extended study area includes the Sacramento River basin downstream from the Red Bluff Diversion Dam to the Delta, the Delta itself, the San Joaquin River basin to the Delta, portions of the American River basin, and the CVP/SWP service areas.

9.1.1 Hazards

Shasta Lake and Vicinity

Water Safety Hazards The surface waters of Shasta Lake and, to a lesser extent, Keswick Reservoir and other surface waters in the vicinity pose hazards to persons engaging in boating and other water-based activities (see Chapter 18, “Recreation,” for a detailed discussion of water safety hazards related to recreational activities). Water safety hazards are related to equipment operations, flow velocity, morphology, instream or submerged material, accessibility, and water temperature. Working in and adjacent to water bodies also poses risks to workers.

Fluctuations in the reservoir’s pool level affect the pattern of submerged obstacles, which poses a risk to boaters, water skiers, operators of personal watercraft, and workers. Reservoir drawdowns can leave rocks, shoals, and islands submerged below the water surface, where watercraft or skiers can strike them. Conversely, increases in the reservoir’s pool level conceal obstacles beneath the water surface that may be visible one day and submerged the next. Most of these hazards are not marked; however, the USFS public information program warns water-based recreationists via signage and various media to use caution when operating watercraft on the lake.

Although the USFS manages Shasta Lake and adjacent Federal lands comprising the NRA’s Shasta Unit, law enforcement and emergency services are provided through a partnership between the Shasta-Trinity National Forest (STNF) and the Shasta County Sheriff’s Office (SCSO) (see Chapter 22, “Public Services,” for a detailed discussion of fire, law enforcement, and emergency services in Shasta Lake and vicinity). SCSO provides safety patrols and emergency response on Shasta Lake and its associated recreational areas and manages a Boating Safety Unit at the Bridge Bay Resort. SCSO staff consists of four full-time personnel and 22 seasonal deputies. An organized citizen volunteer patrol also assists with boater safety on Shasta Lake.

Fire Hazards Wildland fires pose a hazard to rural development, infrastructure, and natural resources. Climate, topography, vegetation characteristics, and ignition sources in a given area influence the degree of fire hazard. The California Department of Forestry and Fire Protection (CDF) and STNF have delineated most of the primary study area as being at very high risk for wildland fire; some areas, such as Lakehead, are at extreme risk for fire (Figure 9-1) (CDF 2005, CDF 2008, USFS 1995, WSRCD 2010).

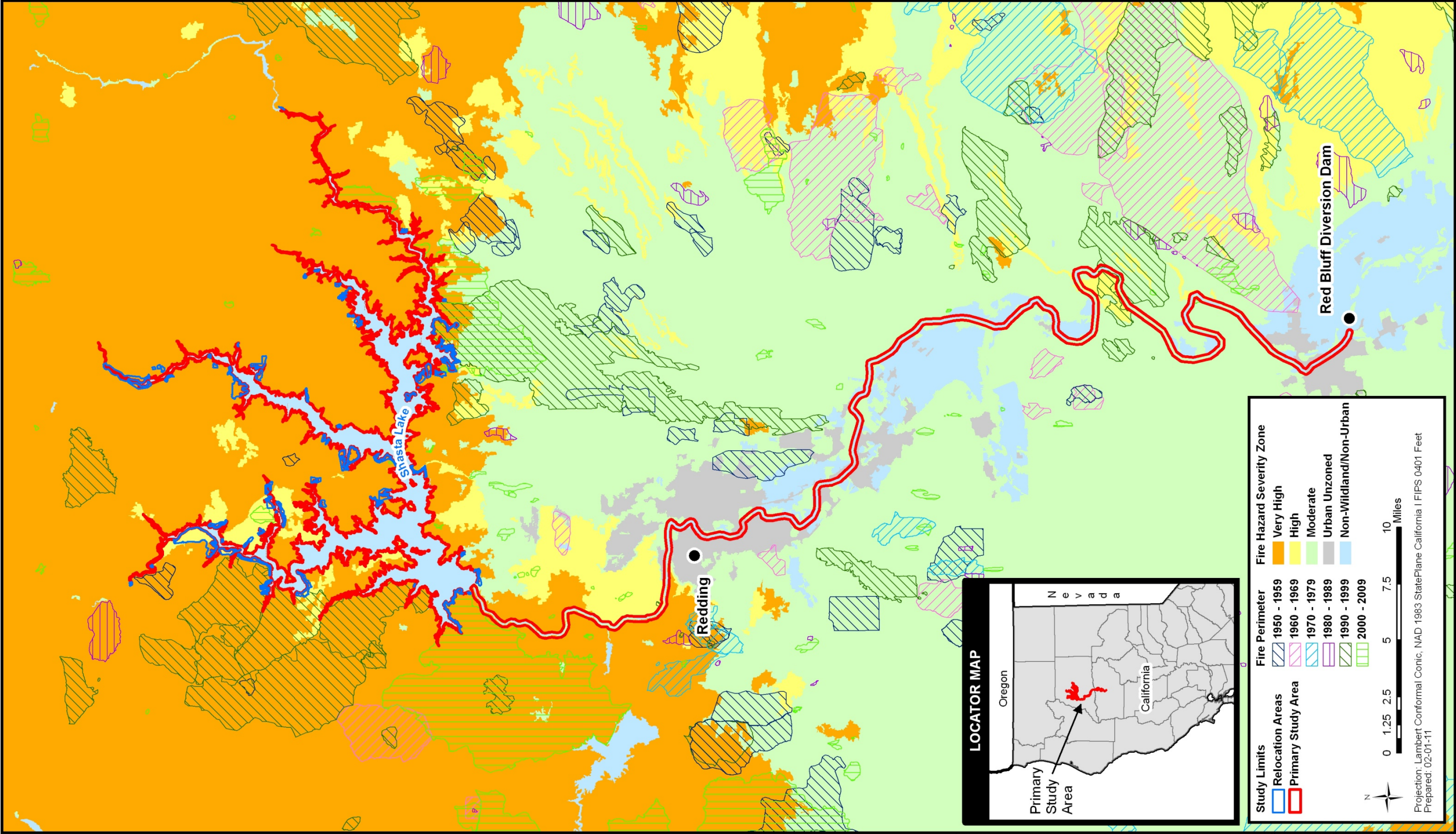


Figure 9-1. Fire Hazard Severity and Historic Fires

This page left blank intentionally.

Historic fire data show that high-intensity, stand-replacing fires commonly occur at the lower elevations surrounding Shasta Lake. Major transportation corridors cross the NRA and the area receives high recreational use, resulting in numerous human-caused fires each year (USFS 1996). During the 5-year period from 2000 through 2004, the Shasta and Trinity units of the NRA experienced 1,545 vegetation fires affecting 40,352 acres (CDF 2005). Roadside fires, abandoned campfires, and fireworks are common causes of these fires. Lightning from summer thunderstorms also causes a significant number of wildfires in and adjacent to the NRA. Large fires (more than 300 acres) that have occurred in the primary study area since 1950 are shown in Figure 9-1.

Rural and urban development has increasingly influenced the wildland fire hazard potential. Development in grasslands, oak woodlands, and forests (generally referred to as the wildland-urban interface (WUI)) and population growth have increased the risk to humans of wildland fire hazards. CDF and other fire protection agencies expect this trend to continue.

Fire suppression has had a significant effect on the volume and types of fuels across the Shasta Lake region. Extreme fire weather conditions are perpetuated by high summer temperatures and dry lightning storms; particularly along the Sacramento and McCloud arms of Shasta Lake, frequent strong zonal north winds occur during the late summer and fall months. In the past 30 years, the Lakehead area, which is along the Sacramento Arm, has experienced several major fires, including the 1999 High Complex Fire, which was eventually contained at 39,000 acres, and numerous smaller fires that were suppressed in their initial stages (WSRCD 2010).

The concentration of human activity along the McCloud Arm of Shasta Lake prompted the STNF to prepare a fire analysis as part of the McCloud Arm Watershed Analysis (USFS 1998). The fire analysis concludes that, at the time it was prepared (1998), more than 17,500 acres of forest surrounding the McCloud Arm was considered at high risk for a catastrophic fire. The fire hazard severity potential in the McCloud Arm has been designated as very high by CDF (CDF 2008).

The Jones Valley/Silverthorn area adjacent to the Pit Arm of Shasta Lake is another interface area with recognized fire hazards. In the last 12 years, two large fires have greatly affected residential and commercial developments in this area. The Bear Fire in 2004 burned 10,484 acres and destroyed 80 homes in the Jones Valley community, and the 1999 Jones Fire burned 26,020 acres and consumed 900 structures.

CDF has devised a fire hazard severity scale that considers fuel load (vegetation is the major source of fuel), climate, and topography (fire hazards increase with slope) to evaluate the level of wildfire hazard in areas where the State is primarily responsible for fire suppression (these are known as State Responsibility Areas). CDF designates three levels of fire hazard severity zones

– moderate, high, and very high – to indicate the severity of fire hazard in a particular geographical area. Based on a review of CDF’s statewide map of fire hazard severity zones, the primary study area includes lands designated as high and very high (Figure 9-1) (CDF 2007).

Fuels management actions are conducted with some frequency on Federal lands in the Shasta Lake and vicinity portion of the study area. Since 2009, USFS has completed, or is currently proposing, several fuels management projects along the various arms of Shasta Lake, including the Bear Hazardous Fuels Project (Pit Arm), the Green-Horse Habitat Restoration and Maintenance Project (between the Pit and McCloud arms), the Interstate-5 Corridor Fuels Reduction Project (upper Sacramento Arm), and the Packers Bay Invasive Plant Species Removal Project (Sacramento Arm) (USFS 2009, 2011).

Upper Sacramento River (Shasta Dam to Red Bluff)

Water Safety Hazards Water safety hazards in the upper Sacramento River are similar to those in Shasta Lake and vicinity. Surface waters (i.e., Keswick Reservoir and the Sacramento River) pose hazards to persons engaging in boating and other water-based activities on these water bodies. Water hazards are posed by equipment operations, flow velocity, morphology, instream or submerged material, accessibility, and water temperature. Working in and adjacent to water bodies also poses risks to workers.

Fire Hazards Wildland and nonwildland fires present hazard risks to rural and urban development in the upper Sacramento River area. Based on a review of CDF’s statewide map of fire hazard severity zones, the upper Sacramento River area includes lands designated as high and very high risk (Figure 9-1) (CDF 2007).

Human activities such as smoking, debris burning, and equipment operation cause 90 percent of the wildland fires in Shasta County, and lightning causes the remaining 10 percent. Wildland fires present a major safety hazard to rural development located in forest, brush, and grass-covered areas. Between 1992 and 2003, an average of 333 wildland fires per year occurred in Shasta County; the majority of these fires were in upland areas, where fire hazards are extreme because of an abundance of highly flammable vegetation and long, dry summers (Shasta County 2004). Large fires (more than 300 acres) that have occurred in the primary study area since 1950, including the upper Sacramento River near Shasta Dam, are shown in Figure 9-1.

Much of Tehama County, outside of the valley floor, is classified as wildland and contains substantial forest fire risks and hazards (PMC 2009). Outside of urbanized areas, fire hazard is considered to be moderate (CDF 2007). Encroachment by development into previously uninhabited areas has expanded the WUI, compounding the challenges of wildland fire management. In the portion of the project area that is in Tehama County, no large fires (greater than 300 acres) have occurred in the last 60 years (Figure 9-1) (CDF 2009), because

vegetation adjacent to the Sacramento River is not conducive to carrying wildland fire.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Water safety hazards are similar to those described for the primary study area. Fire hazard in the extended study area varies, with risk increasing proportionally with the degree of WUI. As noted previously, CDF maintains a map-based program that identifies fire hazard severity zones throughout the state. The program differentiates between State Responsibility Areas and Local Responsibility Areas. Most of the extended study area is mapped as local (or Federal) responsibility areas with moderate or unzoned fire hazard severity classifications (CDF 2008).

9.1.2 Hazardous Materials and Waste

For purposes of this section, the term “hazardous materials” refers to both hazardous substances and hazardous wastes. A hazardous material is defined in the Code of Federal Regulations (CFR) as “a substance or material that ... is capable of posing an unreasonable risk to health, safety, and property when transported in commerce” (49 CFR 171.8). California Health and Safety Code Section 25501 defines a hazardous material as follows:

Hazardous material” means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. “Hazardous materials” include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Hazardous wastes are defined in California Health and Safety Code Section 25141(b) as wastes that

...because of their quantity, concentration, or physical, chemical, or infectious characteristics, [may either] cause, or significantly contribute to an increase in mortality or an increase in serious illness [or] pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Potential sources of hazardous material and waste may exist in the urbanized, rural, industrial, and agricultural portions of the study areas. Hazardous materials may be present in a variety of common contexts, including the following:

- Construction and demolition debris
- Drums
- Landfills or solid waste disposal sites
- Pits, ponds, or lagoons
- Wastewater and wastewater treatment plants
- Fill, dirt, depressions, and mounds
- Herbicides, pesticides, and fungicides
- Contaminated aggregate (mercury, dioxin)
- Explosives
- Fish hatcheries (e.g., Livingston Stone, Coleman)
- Underground storage tanks
- Stormwater runoff structures
- Transformers that may contain polychlorinated biphenyls (PCB)
- Utility poles
- Abandoned mines

Shasta Lake and Vicinity

Facilities used to store, generate, and transport hazardous materials and hazardous waste are present upstream from Shasta Dam. In addition, several inactive or abandoned mines contribute hazardous materials to Shasta Lake or its tributaries. The following discussion describes these features and facilities.

Reclamation operates the Shasta Dam facility and controls the use and movement of hazardous materials and associated hazardous waste in and out of the Shasta Dam administrative compound. Operation and maintenance of the dam and the water project facility require the use of many of the hazardous materials listed in the previous section. In addition, utility poles, transformers, and associated power transmission facilities typically contain hazardous materials.

A number of recreational facilities are located on or adjacent to Shasta Lake. These facilities include marinas, campgrounds, day use facilities, and residences for recreational use. Although several of these are privately owned, most are operated under special use permits issued by USFS. Operation and maintenance of recreational facilities involve the use of a number of substances that are considered hazardous under Federal or State statutes. Additionally, facilities that service and/or repair watercraft (e.g., marinas) generate wastes that are considered hazardous (e.g., oil, grease, solvents).

Currently, there are three underground fuel storage tanks permitted by the State Water Resources Control Board in the primary study area, all of which are in the Shasta Lake and vicinity portion of the primary study area: Holiday Harbor, Sugarloaf Marina, and Digger Bay Marina (SWRCB 2011). Also in the Shasta Lake and vicinity portion are four underground fuel storage tanks that are no longer in use due to regulatory actions resulting from documented occurrences of fuel leaks (SWRCB 2011).

The project would include the decommissioning/abandonment and/or relocation of a number of features and facilities on or adjacent to Shasta Lake. Underground and aboveground fuel storage tanks – including tanks in use and tanks no longer used – would be permanently removed from areas that would be inundated by the project. Above- and belowground fuel pipelines within the inundation area would be relocated/removed. Relocated fuel storage tanks would be designed and constructed in accordance with Title 23 of the California Code of Regulations (Division 3, Chapter 15, Underground Tank Regulations); the Uniform Fire Code; California Air Resources Board; Shasta County Development Standards, Section 6.7; and Shasta County Environmental Health Division requirements. Additionally, the age of some buildings suggests that substances such as asbestos or lead paint may be included in demolition debris.

A records search of the Federal Superfund National Priorities List (NPL) identified no sites in the Shasta Lake and vicinity portion of the study area. In its scoping comments, the Central Valley Regional Water Quality Control Board identified three sites that are currently subject to some degree of remediation. These sites are associated with the Bully Hill/Rising Star Mine and the Digger Bay and Sugarloaf marinas. All three sites may be influenced by fluctuating water levels in Shasta Lake. An additional site near the Bully Hill Mine complex contains depositional features with elevated metal concentrations that are exposed to surficial and wave erosion processes. Central Valley Regional Water Quality Control Board has also identified an abandoned mine complex west of Shasta Dam (Golinsky Mine) as a source of heavy metals and acid mine discharge that enters Shasta Lake via Dry Creek.

Interstate 5 (I-5) and Union Pacific Railroad transportation corridors are near to Shasta Lake and its tributaries. The potential exists for the accidental spill of chemicals and hazardous materials transported through these travel corridors. Transport through mountainous terrain and over water bodies, equipment failure, and improper storage and handling of hazardous materials contribute to the risk of accidental chemical spills.

The Cantara Spill is a prime example of the hazards associated with the transport of hazardous materials through the region. On July 14, 1991, a Southern Pacific train derailed upstream from Dunsmuir, sending several cars into the Sacramento River, including a tank car containing the herbicide/pesticide metam sodium (a potent chemical used principally to sterilize soil for agricultural purposes). A rupture in one of the tank cars resulted

in the catastrophic spill of approximately 19,000 gallons of the soil fumigant into the river. When mixed with water, metam sodium breaks down into several highly toxic compounds. Although the toxins formed by the mixing of metam sodium with water dissipated in a matter of hours or weeks, the immediate effects of the spill were staggering. In the upper Sacramento River, every living aquatic creature downstream from the spill died over the 20-mile stretch of river between the spill and Shasta Lake (Cantara Trustee Council 2007). On July 17, 1991, the plume, estimated to have traveled at just under 1 mile per hour, entered Shasta Lake, where the chemical was reduced to undetectable levels approximately 2 weeks later. As a result of the Cantara Spill, more than \$14 million in settlement funds – administered by the Cantara Trust Council – have been available for ecosystem restoration.

Historic mining activities in the Shasta Lake and vicinity portion of the primary study area have left mine tailings piles scattered throughout the uplands surrounding the lake. These tailings piles often contain high concentrations of various metals, including iron, copper, zinc, and mercury. The discharge of these dissolved metals into waterways can have an adverse effect on water quality, aquatic ecosystems, and human health. The historic Bully Hill Mine, located along the Squaw Arm, is the only mine site that would be inundated by the project. The effects on water quality that could result from the inundation of mine tailings are discussed in detail in Chapter 7, “Water Quality.”

Upper Sacramento River (Shasta Dam to Red Bluff)

A number of business and industrial land uses in the upper Sacramento River area use and transport hazardous materials as part of their operations. Existing land uses that may have a hazardous material component include mining operations, heavy and light industrial uses, propane/petroleum fueling and/or storage facilities, and commercial and retail operations. Businesses that require storage of hazardous materials must submit a Hazardous Material Business Plan (HMBP) to the County Environmental Health Department. I-5, Union Pacific Railroad lines, and several major surface routes are used for the transportation of hazardous materials throughout the region.

Hazardous waste sites associated with agricultural activities include storage facilities and agricultural ponds or pits contaminated with fertilizers, pesticides, herbicides, or insecticides. Petroleum products and other materials may also be present in the soil and groundwater near leaking underground tanks used to store these materials. However, there are no permitted underground fuel storage tanks – Including tanks currently in use or tanks that have been subject to regulatory actions – within the project boundaries for the upper Sacramento River portion of the primary study area (SWRCB 2011).

Metals such as cadmium, copper, mercury, and zinc are present in inactive and abandoned mines in the upper Sacramento River area. Landfills and commercial activities, such as dry cleaning, could also be sources of contamination in this

region. The project would not result in the inundation of any of these potentially hazardous locations.

A records search of the U.S. Environmental Protection Agency's (EPA) NPL identified one site in the upper Sacramento River area: Iron Mountain Mine. The mine is a privately owned site southwest of Shasta Dam and 9 miles northwest of Redding. The entire mine area, which encompasses about 2,000 acres, is drained by Boulder Creek and Slickrock Creek, tributaries to Spring Creek. Spring Creek enters Keswick Reservoir several miles downstream from Shasta Dam.

From the 1860s through 1963, the 4,400-acre Iron Mountain Mine was periodically mined for iron, silver, gold, copper, zinc, and pyrite. Although mining operations were discontinued in 1963, underground mine workings, waste rock dumps, piles of mine tailings, and an open mine pit remain at the site. Historic mining activity at Iron Mountain Mine has fractured the rock units, exposing minerals to surface water, rainwater, and oxygen. Acidic mine drainage typically contains high concentrations of copper, cadmium, zinc, and other heavy metals. Much of the acidic mine drainage ultimately is channeled into Spring Creek Reservoir via adjacent creeks and constructed diversion facilities. The low pH level and the heavy metal contamination from the mine have virtually extirpated aquatic life in sections of Slickrock Creek, Boulder Creek, and Spring Creek. (Project effects on potentially contaminated historic mine waste are discussed in Chapter 7, "Water Quality".)

Reclamation periodically releases water from Spring Creek Reservoir into Keswick Reservoir. Planned releases are timed to coincide with the presence of diluting releases of water from Shasta Dam. On occasion, uncontrolled spills and excessive waste releases have occurred when Spring Creek Reservoir reaches capacity. Without sufficient dilution, these events have resulted in the release of harmful quantities of heavy metals into the Sacramento River downstream from Keswick Dam. Acid mine drainage and associated heavy-metal contamination from the Spring Creek drainage and other abandoned mine sites are among the principal water quality issues in the upper Sacramento River portion of the primary study area. In recent years, Reclamation has implemented a dredging program to restore active storage space in Keswick Reservoir, which has been reduced by the influx of sediment from the Spring Creek watershed.

In 2009, EPA began the removal of approximately 200,000 cubic yards of contaminated sediment from the Spring Creek Arm of Keswick Reservoir for disposal in an engineered disposal cell. The project was near completion at the end of 2010. EPA plans to use a hydraulic dredge to fully remove contaminated sediments located in two areas that have high erosion potential and to partially remove sediments located in a deep-water area of the Spring Creek Arm (EPA 2008).

The Livingston Stone National Fish Hatchery facility, located at the foot of Shasta Dam, is used to propagate adult winter-run Chinook salmon collected from the mainstem Sacramento River. Water from Shasta Dam is used to supply the hatchery and waste is discharged to the Sacramento River downstream from the dam. The facility's discharge is regulated under the Central Valley Water Board General Order R5-2010-0018 (National Pollutant Discharge Elimination System No. GAG135001) Waste Discharge Requirements for Cold-Water Concentrated Aquatic Animal Production Facility Discharges to Surface Waters (California RWQCB 2010).

Lower Sacramento River and Delta and CVP/SWP Study Areas

Many of the land uses in the extended study area are similar to those in the primary study area. Thus, contamination is possible from agricultural, urban, industrial, commercial, landfill, and military land uses in the region. Because the extended study area covers many counties and regions, a records search of the NPL and the California Department of Toxic Substances Control list was not conducted. Although many sites in the extended study area undoubtedly are on these lists, it is not expected that these sites would be affected by project implementation.

Facilities created by CVP/SWP for the purposes of water conservation and management include dams, powerplants, and an extensive canal system. Operation of these facilities involves the use of a variety of hazardous materials such as lubricants.

The Sacramento National Wildlife Refuge Complex consists of five national wildlife refuges and three wildlife management areas covering over 35,000 acres of wetlands and uplands, in addition to more than 30,000 acres of conservation easements. Many of the wetlands in the Sacramento Valley receive water not only from the Sacramento River, but also from agricultural runoff. Urban, industrial, agricultural, and natural sources of toxins contribute to water quality problems in the lower Sacramento River and Delta and can pose a hazard to fish and wildlife through processes such as bioaccumulation in the food chain.

A discussion of the current water quality and potential hazards to water quality associated with the project is presented in Chapter 7, "Water Quality."

9.2 Regulatory Framework

9.2.1 Federal

Federal Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) is a Federal statute designed to provide "cradle to grave" control of hazardous waste by imposing management requirements on generators and transporters of hazardous wastes,

and on owners and operators of treatment, storage, and disposal facilities. The EPA is responsible for administering the RCRA.

Federal Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as the Superfund Act, provides for the liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites. CERCLA authorized the NPL, which identifies contaminated sites that are eligible for remedial action. The scope of CERCLA is broad; it holds current and prior owners and operators of contaminated sites responsible, and its definition of a hazardous substance incorporates definitions from the Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, and the RCRA (CERCLA Section 101(14)). EPA is the agency responsible for administering CERCLA.

Occupational Safety and Health Act

The Occupational Safety and Health Act defines occupational health and safety standards with the goal of providing employees with a safe working environment. The California Occupational Safety and Health Administration (Cal/OSHA) is the agency responsible for administering this Federal act. The Occupational Safety and Health Administration (OSHA) regulations apply to the workplace and cover activities ranging from confined space entry to toxic chemical exposure. Employers are required to provide a workplace free of recognized hazards that could cause serious physical harm. OSHA regulates workplace exposure to hazardous chemicals and activities through workplace procedures and equipment requirements (29 U.S.C. 651-678).

Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act regulates interstate transport of hazardous materials and wastes. This act specifies driver training requirements, load labeling procedures, and container design and safety requirements. Transporters of hazardous wastes must also meet the requirements of other statutes, such as the RCRA. The Hazardous Materials Transportation Act requires that carriers report accidental releases of hazardous materials to the U.S. Department of Transportation at soon as is practical (49 CFR Subchapter C). Incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding \$50,000. U.S. Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration are the agencies responsible for administering the Hazardous Materials Transportation Act.

Code of Federal Regulations, Title 36

Title 36 of the CFR governs parks, forests, and public property in the United States. Chapter 2, Section 260, pertains to prohibited activities within the

boundaries of Federally owned lands and waters administered by the USFS. The USFS is responsible for administering the regulations described as follows.

Sec. 261.5 Fire (General Prohibitions) The following are prohibited:

- Carelessly or negligently throwing or placing any ignited substance or other substance that may cause a fire
- Firing any tracer bullet or incendiary ammunition
- Causing timber, trees, slash, brush, or grass to burn except as authorized by permit
- Leaving a fire without completely extinguishing it
- Allowing a fire to escape from control
- Building, attending, maintaining, or using a campfire without removing all flammable material from around the campfire adequate to prevent its escape

Sec. 261.52 Fire (Prohibitions in Areas Designated by Order) When provided by an order, the following are prohibited:

- Building, maintaining, attending or using a fire, campfire, or stove fire
- Using an explosive
- Smoking, except within an enclosed vehicle or building, a developed recreation site, or while stopped in an area at least 3 feet in diameter that is barren or cleared of all flammable material
- Possessing, discharging, or using any kind of firework or other pyrotechnic device

Shasta-Trinity National Forest Land and Resource Management Plan

The STNF Land and Resource Management Plan (LRMP) contains goals, standards, and guidelines designed to guide the management of STNF. The following goals, standards, and guidelines relative to hazards and/or hazardous materials issues associated with the project area were excerpted from the LRMP (USFS 1995).

Facilities Goals (LRMP, p. 4-17)

- Provide and maintain those administrative facilities that effectively and safely serve the public and USFS work force.

Facilities Standards and Guidelines (LRMP, p. 4-17)

- Upgrade the surfacing on the forest's road system as necessary to protect the road and other resource values.
- Trails will be maintained as needed for specific management objectives. Erosion control and primary access will receive priority.
- Trails and trail bridges will be located, designed, constructed, and maintained so that they are suitable for the type of travel being served.
- Consider volcanic, seismic, flood, and slope stability hazards in the location and design of administrative and recreation facilities.
- Manage, construct, and maintain buildings and administrative sites to meet applicable codes and to provide the necessary facilities to support resource management.
- Monitor potable water sources and designated swimming areas according to the Safe Drinking Water Act and other regulatory health requirements.

Management Guide for the Shasta and Trinity Units of the Whiskeytown-Shasta-Trinity National Recreation Area

The STNF Management Guide contains management strategies intended to achieve or maintain a desired condition. These strategies take into account opportunities, management recommendations for specific projects, and mitigation measures needed to achieve specific goals. STNF is responsible for administering the following strategies related to hazards and/or hazardous materials issues associated with the project area.

Fire and Fuels (Management Guide, p. IV-1)

- Treatment of fuels created by project activities will be determined during project planning.
- Treatment of natural fuels for hazard reduction will be high priority in and around urban interface areas. Treatment of natural fuels near developed recreation sites will be a secondary priority, unless hazard and risk analysis shows a specific need.

Health and Safety (Management Guide, pp. IV-15 Through IV-16)

- Resorts/marinas are responsible for inspecting their own facilities to ensure that they comply with applicable laws, ordinances, and codes and standards for health and safety and are safe for public use. Copies of all health and safety inspections must be incorporated in the operation and maintenance plan annually and be available to the STNF.

- Marinas are required to anchor docks using underwater cables and anchor systems. Minor exceptions may be made, with STNF approval, in areas where low-speed boating is required, such as behind a marina in a semi-enclosed, restricted waterway. If cables and anchors are positioned in main travel-ways where they can come in contact with boats or people, the cables must be flagged and have warning lights so that they are visible day and night.
- Buoys and floats placed and maintained by marinas must meet the following criteria:
 - If the float or buoy is constructed of a material that will not damage a boat or cause personal injury on contact, the float or buoy must be of a contrasting color that can be easily seen. Examples are floats and buoys made of lightweight Styrofoam and plastic.
 - If the float or buoy is made of a material that could damage a boat or cause personal injury on contact, it must be of a contrasting color that can be easily seen, and must have a blinking yellow light visible from 360 degrees for night boating safety. Examples are floats and buoys made of steel or aluminum.
 - Log booms may be installed around marinas to suppress wave action at the docks. Log booms must not infringe on the main boating channels. Log booms must have yellow blinking lights installed every 100 feet on or immediately adjacent to the boom so that the boom's location is visible at night. Boating entrances through log booms or other breakwaters will display red and green navigation lights on either side of the log boom or breakwater for nighttime navigation.
 - All docks that are approved to extend out into a main boating travel-way, and are not protected by a lighted breakwater or other lighting system, must have at least one blinking yellow light for nighttime boating safety every 100 feet.
- No work that would leave pollutants in the lake when the area is inundated is permitted below the lake high-water line. Examples of this are water blasting and sand blasting pontoons and mechanical repairs that would allow oil and grease to drain on the ground.
- Resorts/marinas may restrict vehicle nighttime land access to their facilities if they can display to STNF that such action is needed to protect people and property.

Vegetation (Management Guide, p. IV-18)

- Prescribed burning, fuel break construction, and other forms of vegetation manipulation will be used to reduce fire hazards and improve forest health.

- Hazard trees in traditionally high-use recreation areas that pose safety hazards to people or property will be identified and removed.

U.S. Bureau of Land Management Resource Management Plan

The U.S. Bureau of Land Management (BLM) manages a number of public lands adjacent to the Sacramento River corridor downstream from Shasta Dam. The study area falls under two BLM districts (Northern California and Central California) and the resource management plans of three BLM field offices: Redding, Ukiah, and Mother Lode (BLM 2006a). The purpose of BLM's resource management plans is to provide an overall direction for managing and allocating public resources in each planning area. BLM is responsible for administering the following strategies related to hazards and/or hazardous materials issues common to the districts in the study area (BLM 1992, 2006b, 2008).

Wildfire Suppression Goal

- Provide an appropriate management response for all wildland fires, emphasizing firefighter and public safety.

Fuels Management Goals

- Reduce fire risk to the wildland-urban interface communities.
- Protect riparian and wetland areas.
- Improve ecological conditions and reduce the risk of catastrophic wildfire through the use of prescribed burning.
- Improve ecological conditions and reduce the risk of catastrophic wildfire through mechanical treatments.
- Increase the public's knowledge of the natural role of fire in the ecosystem, and hazards and risks associated with living in the wildland-urban interface.

Hazardous Materials

- Land use authorizations will not be issued for uses that would involve the disposal or storage of materials that could contaminate the land (e.g., hazardous waste disposal sites, landfills, rifle ranges).
- Minimize hazardous conditions on BLM lands to reduce risks to the public and ensure environmental health and safety.

9.2.2 State

Hazardous Waste Control Act

The California Hazardous Waste Control Act governs hazardous waste management and cleanup in the State (Health and Safety Code, Ch. 6.5–6.98).

The act mirrors the RCRA and imposes a “cradle to grave” regulatory system for handling hazardous waste in a manner that protects human health and the environment. It requires all businesses to report the quantity and locations of hazardous materials on an annual basis if the business stores (a) more than 55 gallons of a liquid or 500 pounds of a solid hazardous material, (b) more than 200 cubic feet of a compressed gas, or (c) a radioactive material that is handled in quantities for which an emergency plan is required. Businesses falling within these limits must prepare a HMBP, which includes spill prevention, containment and emergency response measures and a contingency plan.

County Environmental Health Departments and the California Environmental Protection Agency’s (Cal/EPA) Certified Unified Program Agencies assume responsibility for enforcing local hazardous waste reporting requirements. Sites that store, handle, or transport specified quantities of hazardous materials are inspected annually. Cal/EPA, Department of Toxic Substances Control, regulates the generation, transportation, treatment, storage, and disposal of hazardous waste under the RCRA and the State Hazardous Waste Control Act.

Hazardous Substances Account Act

California enacted the Hazardous Substances Account Act (1981) to establish State authority to clean up hazardous substances releases, compensate persons injured from exposure to hazardous substances, and provide funds for payment of the State’s mandatory 10 percent share of cleanup costs under the Federal Superfund law. Cal/EPA administers the State Superfund program and receives assistance from the California Department of Public Health.

Emergency Response Plan

California developed an Emergency Response Plan to facilitate and coordinate responses to emergencies. Emergency prevention and response to hazardous materials incidents are part of the State plan that is administered by the California Office of Emergency Services (OES). Coordinating agencies include Cal/EPA, California Highway Patrol (CHP), CDF, local fire departments, the California National Guard, the California Department of Transportation (Caltrans), DFG, regional water quality control boards, and other emergency service providers.

California Code of Regulations, Title 13, Vehicle Code

In addition to the RCRA hazardous waste transportation standards, California regulates the transportation of hazardous waste originating or passing through the state. State regulations are contained in the California Code of Regulations (CCR), Title 13, Vehicle Code. Hazardous waste must be regularly removed from generating sites by licensed hazardous waste transporters. Transported materials must be accompanied by hazardous waste manifests.

CHP and Caltrans are responsible for enforcing Federal and State regulations pertaining to the transport of hazardous materials through California. CHP enforces materials and hazardous waste labeling and packaging regulations that

prevent leakage and spills of material in transit and provides information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of CHP. CHP conducts regular inspections of licensed transporters to assure regulatory compliance. CHP and Caltrans also respond to hazardous materials transportation emergencies. Caltrans has emergency chemical spill identification teams at locations throughout the state.

Worker Safety Requirements

Regulations pertaining to the use of hazardous materials in California workplaces are provided in CCR Title 8 and include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA standards are more stringent than Federal OSHA regulations.

As described above, Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations in the state. Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating information related to hazardous substances and their handling, and preparing health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that material safety data sheets be available to employees and that employee information and training programs be documented.

Government Planning

California law requires that each county and city in the state adopt a general plan (Government Code Sec. 65300). The State-mandated general plans consist of development policies and objectives for the long-term physical development of counties and cities. Each general plan must include a safety element that addresses a variety of natural and human-caused hazards. At a minimum, the safety element must adopt policies related to fire safety, flooding, and geologic and seismic hazards (Government Code Sec.65302(g)).

California Building Code

In 2007, the California Building Code was amended to include regulations pertaining to fire safety. The amendments provide safety standards for new construction located in WUI areas. The building code requires landowners to maintain an area of defensible space around structures and requires the use of fire-resistant building materials. County building inspectors, CDF, and local fire agencies are responsible for enforcing the requirements (CCR Title 24, Part 2). On Federal lands, the Federal agency is responsible for ensuring that buildings and facilities meet public health and safety standards.

9.2.3 Regional and Local

County General Plans

The general plans for the counties in the primary and extended study areas contain general policies aimed at reducing the use of hazardous substances and the generation of hazardous waste and ensuring safe use and storage of hazardous materials and management of hazardous waste.

County Fire Management Plans

Fire Management Plans have been prepared for Tehama County and Shasta County (CDF and Tehama Fire-Safe Council 2005; SCFD 2007; CDF 2005). The plans tier from the California Fire Plan and are intended to be used for prefire planning, prioritization, and implementation. The plans outline cooperative efforts of local fire agencies, CDF, and fire safe councils.

9.3 Environmental Consequences and Mitigation Measures

9.3.1 Methods and Assumptions

This analysis addresses potential impacts associated with implementation of the project with respect to hazards and hazardous materials. This analysis is based on a review of planning documents applicable to the project area, consultation with appropriate agencies, and field reconnaissance.

9.3.2 Criteria for Determining Significance of Effects

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by, or result from, the projects. Under NEPA, the significance of an effect is used solely to determine whether an Environmental Impact Statement must be prepared. An environmental document prepared to comply with CEQA must identify the potentially significant environmental effects of a proposed project. A “[s]ignificant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions in the area affected by the project (State CEQA Guidelines, Section 15382). CEQA also requires that the environmental document propose feasible measures to avoid or substantially reduce significant environmental effects (State CEQA Guidelines, Section 15126.4(a)).

The following significance criteria are based on guidance provided by CEQA Guidelines (AEP 2010) and consider the context and intensity of the environmental effects as required under NEPA. Impacts concerning hazards and hazardous materials would be significant if they:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment
- Emit hazardous emissions or involve the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school
- Are located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires

9.3.3 Topics Eliminated from Further Consideration

Water safety hazards posed by the project alternatives to water-based recreationists are assessed in Chapter 18, “Recreation”; therefore, this topic has been eliminated from further analysis in this chapter. Similarly, the effects of hazardous materials on water quality are assessed in Chapter 7, “Water Quality.”

9.3.4 Direct and Indirect Effects

Information on fire risk and severity was obtained from USFS and CDF. This information was used to identify specific types and locations of activities that could present a threat to the human environment as a result of wildland fires.

A regulatory database search was conducted for portions of the primary study area. The purpose of such a search was to identify sites that are associated with the documented use, generation, storage, or release of hazardous materials or petroleum products. The results also include regulatory lists of known or potential hazardous waste sites, landfills, hazardous waste generators, and disposal facilities, in addition to sites under investigation. Information provided in the database search was obtained from publicly available sources, including the following:

- Cortese List (California Department of Toxic Substances Control 2011)
- Leaking Tanks (SWRCB 2011)
- Comprehensive Environmental Response, Compensation and Liability Information System: EPA Superfund Sites (EPA 2011)

- Annual Work Plan (SWRCB et al. 2008)

No-Action Alternative

Shasta Lake and Vicinity, Upper Sacramento River (Shasta Dam to Red Bluff), Lower Sacramento and Delta, and CVP/SWP Service Areas

Impact Haz-1 (No-Action): Wildland Fire Risk Under the No-Action Alternative, no new facilities would be constructed in the primary or extended study areas and no changes in Reclamation's existing facilities or operations would occur that would directly or indirectly result in any increase in the risk of wildland fire in the project area. Therefore, the No-Action Alternative would not have an impact on wildland fire hazards in the project area. Mitigation is not required for the No-Action Alternative.

Impact Haz-2 (No-Action): Release Potentially Hazardous Materials or Hazardous Waste Under the No-Action Alternative, no new facilities would be constructed in the primary or extended study areas and no changes in Reclamation's existing facilities or operations would occur that would directly or indirectly result in any increase in hazards, hazardous materials, or hazardous waste in the project area. Therefore, the No-Action Alternative would not have an impact related to the release of hazardous materials or hazardous waste in the project area. Mitigation is not required for the No-Action Alternative.

Impact Haz-3 (No-Action): Expose Workers to Hazardous Materials Under the No-Action Alternative, no new facilities would be constructed in the primary or extended study areas and no changes in Reclamation's existing facilities or operations would occur that would directly or indirectly result in any increase in exposure of workers to hazards, hazardous materials, or hazardous waste in the project area. Therefore, the No-Action Alternative would not have an impact involving exposure of workers in the project area to hazardous materials. Mitigation is not required for the No-Action Alternative.

Impact Haz-4 (No-Action): Expose Sensitive Receptors to Hazardous Materials Under the No-Action Alternative, no new facilities would be constructed in the primary or extended study areas and no changes in Reclamation's existing facilities or operations would occur that would directly or indirectly result in any increase in hazards, hazardous materials, or hazardous waste in the project area. Therefore, the No-Action Alternative would have no impact on sensitive receptors in the project area. Mitigation is not required for the No-Action Alternative..

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Haz-1 (CP1): Wildland Fire Risk Project implementation could contribute to wildland fire risk. Project construction and operation, and the anticipated post-construction human activity in the primary study area would

increase the potential for fire ignition. Therefore, this impact is considered potentially significant.

Wildland fire in the primary study area would expose people, structures, infrastructure, and other resources to a significant risk of loss, injury, or death. Project design, implementation, and operation incorporate safety measures that prevent fire hazards. Although the construction details have not been finalized, this conclusion is based on the scope of activities involved and the fire hazard ratings (i.e., very high risk and extreme risk) in the primary study area and the relocation sites where project construction activities would occur. Construction activities would likely occur during the summer and fall months, which are generally considered a time of high fire hazard in northern California. Reclamation and its contractors would follow fire safety regulations and procedures to prevent accidental fires.

Project activities associated with the removal and relocation of utilities could pose a wildland fire hazard in the primary study area, although it is anticipated that 100 percent vegetation clearance beneath high-voltage power transmission lines (typically 60 to 230 kilovolts) will be maintained. Under CP1, approximately 31,000 feet (5.8 miles) of power transmission lines and 35,000 feet (6 miles) of telecommunications lines would require demolition and relocation to prevent inundation by the new reservoir elevation resulting from project implementation. In addition, six power towers would be demolished, and six new towers would be constructed in new locations. CP1 also involves several miles of road construction and demolition of several vehicle and railroad bridges.

Other utility relocations and/or construction proposed under CP1 include potable water facilities, gas/petroleum facilities, and wastewater facilities. Vegetation clearing would be required to varying degrees for most utility relocation/construction, some of which would be located in densely vegetated areas. During construction/relocation, the potential would exist for the ignition of fire by construction equipment operating in the area. Although the increased risk of ignition would be short term (i.e., during implementation), it would be significant. CP1 would also include demolition and construction of recreational and public service facilities.

Relevant safety codes/procedures related to fire prevention would be incorporated into the project design, and would be used during construction activities and project operation and maintenance. Safety codes and procedures would include the California Building Code; the Shasta County Fire Plan; USFS safety requirements regarding fire hazards; California Public Utilities Code General Order 95, which provides procedures for proper removal, disposal, and placement of poles, wires, and associated infrastructure; and the National Electric Safety Code (a voluntary code that provides safety procedures for electric utility installation and operation). Precautionary measures to prevent construction-related fires include locating utilities a safe distance from

vegetation and structures, proper construction of power lines, and construction worker safety training. Post-construction infrastructure operation and maintenance would follow current safety practices associated with fire prevention and would include clearing vegetation from power utility facilities and other sources using combustion engines (e.g., water pumps) on a regular basis.

Right-of-way easements obtained for transmission lines would be cleared of vegetation to provide for public and worker safety, and to provide reliable operations. The California Building Code, the National Electric Safety Code, and the Shasta County Fire Plan clearance requirements for power distribution facilities would be incorporated into the project design.

No new facilities or project construction would occur in the upper Sacramento River area, however, some aggregate material for the project might be extracted could occur downstream from Shasta Dam. In addition, flammable vegetation below Shasta Dam would readily carry a fire started elsewhere in the primary study area.

Project materials and workers traveling to the construction sites from the upper Sacramento River area could also increase the risk of fire hazard over their route. Operation of motor vehicles throughout the region, particularly when vegetation adjacent to roadways is dry, imparts a certain level of fire potential from accidental combustion (e.g., sparks), hot metal (e.g., tail pipes, motors), or traffic accidents which could result in fire.

Project activities, including those intended to mitigate impacts on vegetation, are expected to reduce the overall fuel loading around the Shasta Lake and vicinity portion of the primary study area, thereby reducing the long-term fire hazard. In addition, the project could result in additional water supplies in the primary study area, which could assist future fire responses in the primary study area.

Project activities would increase the risk of wildland fires. Therefore, this impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-2 (CP1): Release Potentially Hazardous Materials or Hazardous Waste Project construction and operation would involve the transportation, use, or storage of hazardous materials. Local, State, and Federal safety codes and procedures related to hazardous material transport, handling, and disposal would be followed for project construction and operation to minimize the risk of a hazardous materials release. However, an accidental release resulting from project activities could expose the public and the environment to a significant safety hazard. Therefore, this impact is considered potentially significant.

Project facilities proposed for construction under CP1 would be located in the Shasta Lake and vicinity portion of the primary study area. Certain hazardous materials needed for construction and operation would need to be stored at the Shasta Dam facility and at other utility and infrastructure relocation sites around the primary study area. Certain hazardous materials would be used to operate equipment both during and after construction, and the construction, and operation, and maintenance of project facilities and infrastructure would require the use of potentially hazardous materials such as paint, concrete, and wood preservatives. In addition, industrial uses associated with the operation and maintenance of the modified Shasta Dam compound would require the use, storage, and routine transport of small quantities of hydraulic fluids, solvents, and other standard mechanical maintenance fluids.

Construction staging and equipment and materials storage, including storage of possible contaminants, and equipment maintenance in the primary study area would occur in areas specified by Reclamation. Staging areas would likely be located in disturbed areas or existing facilities that would be inundated after the dam is raised, such as campgrounds, recreation parking facilities, the top of Shasta Dam, and the parking area along the left wing dam. All staging areas would be located at least 100 feet from bodies of water, wherever possible. Equipment refueling and maintenance would not occur within 100 feet of water bodies, wherever possible.

Seven existing gas/petroleum facilities would be subject to inundation under CP1 and would be relocated subsequent to demolition. The existing fuel tanks would be excavated and all associated piping would be removed. Hazardous material tests and removal would be performed, as required, in accordance with Title 23 CFR, Division 3, Chapter 16: Underground Tank Regulations, and in accordance with Shasta County Environmental Health Division requirements. In addition to adherence to the directives of Title 23, relocated tanks would be designed and constructed in accordance with the Uniform Fire Code; California Air Resources Board; Shasta County Development Standards, Section 6.7 (December 1997); and Shasta County Environmental Health Division requirements. Relocated tanks would be located in cleared areas with code-mandated clearances from other facilities.

Aggregate material for the project could originate from the drawdown portion of Shasta Lake and from areas downstream from Shasta Dam (e.g., Churn Creek bottom, Clear Creek confluence, Keswick Reservoir). These materials could contain hazardous substances such as mercury or selenium. Hazardous materials released into area waterways, including Shasta Lake and many of upper Sacramento River tributaries, come from past land use activities (e.g., mining) or natural sources (e.g., asbestos, selenium) and are likely to be trapped in lake-bottom, river, or floodplain sediments.

Aggregate extraction could also require operation of heavy equipment next to and in Shasta Lake or the upper Sacramento River. Reclamation may use

aggregate supplies from Shasta Lake or the upper Sacramento River floodplain for dam construction materials in the general vicinity of Bridge Bay Marina and Lakeshore Drive. Several additional aggregate sources near the existing shoreline of Shasta Lake are also being considered (e.g., Bass Mountain, Stillwater Creek valley, Gray Rocks). Excavation and extraction of aggregate from these sources, or the augmentation of gravel in the Sacramento River, would require the use of construction equipment, which would involve the use of various hazardous materials such as fuel, oils, grease, and other petroleum products. These contaminants could be introduced into water systems, either directly or through surface runoff.

Project implementation could result in dam operations that would inundate abandoned or inoperative mines located next to Shasta Lake. Areas adjacent to the Bully Hill/Rising Star property contain hazardous materials that would affect Shasta Lake. The effects of CP1 on mines in the primary study area and the upper Sacramento River are discussed in Chapter 7, "Water Quality."

Four vehicle bridges would be removed under CP1: Charlie Creek Bridge, Doney Creek Bridge, McCloud River Bridge, and Didallas Creek Bridge. Bridge demolition, as well as the demolition of other structures and facilities that would be inundated under CP1, could require handling of hazardous waste including asbestos, lead paint, and wood preservatives. This hazardous waste, along with any additional forms of hazardous waste materials generated by project construction, would be removed to an approved landfill for disposal per permit requirements. Transport of hazardous materials would be conducted in accordance with CCR Title 26 and would be licensed by the CHP, pursuant to California Vehicle Code, Section 32000, which requires proper packaging and licensing by hazardous materials haulers.

Although the environmental commitments for all action alternatives include the development and implementation of a Construction Management Plan, Erosion and Sediment Control Plan, Stormwater Pollution Prevention Plan, and Revegetation Plan as well as water quality and fisheries conservation measures and compliance with all required permit terms and conditions, the accidental release of hazardous materials or waste could expose the public and the environment to a significant safety hazard. Therefore, this impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-3 (CP1): Expose Workers to Hazardous Materials Project implementation could result in the exposure of workers to hazardous materials. The project would require the use of potentially hazardous materials to operate construction equipment and to construct various facilities. Reclamation and project contractors would follow local, State, and Federal regulations and procedures for properly transporting, handling, and storing hazardous materials and hazardous waste to decrease the risk of exposure; however, there is a possibility of accidents that could expose project workers to hazardous materials. Structures proposed for demolition, such as bridges, may contain

asbestos, lead paint, toxic wood preservatives, or other hazardous substances. Fuel tanks and utility infrastructure (e.g., transformers containing PCBs) proposed for relocation also would involve some risk of exposure to hazardous substances. However, at this time it appears that the quantities and types of hazardous materials and possible exposure levels to these materials in the workplace would not pose a significant risk to worker health and safety. Furthermore, there are no known hazardous waste sites in the primary study area. Therefore, this impact would be less than significant.

Project workers would be required to transport hazardous materials at various times, in various quantities, and for various stages of project development. I-5 and local roadways would be used to transport hazardous materials and hazardous waste to and from Shasta Lake and vicinity during construction and dam operations. Traffic accidents or equipment failure could expose project workers to hazardous materials. Reclamation and contractors would follow appropriate safety procedures to minimize these risks.

Project construction activities associated with utility line removal and relocation could expose workers to health risks associated with wood preservatives used on wooden utility poles and PCBs, which are commonly found in transformers. Approximately 66,000 feet of power and telecommunication lines and six power towers would be demolished and relocated to avoid inundation resulting from the proposed change in Shasta Lake's elevation. A large number of wooden utility poles would be demolished and relocated outside of the inundation area. Construction activities associated with utility demolition and relocation are estimated to take 3 to 4 years. During that time, workers handling utility poles and transformers would follow protocols to minimize exposure to hazardous material and hazardous waste.

Aggregate extraction from sites in the primary study area that may contain hazardous materials entrained in sediments, such as mercury, could result in the exposure of workers to toxic substances. During construction, workers involved in gravel extraction activities would follow protocols to minimize exposure to hazardous materials.

Shasta Dam operations could expose workers at the facility to hazardous materials. Dam operations require the use of fuels, oils, greases, and solvents. Additional amounts of hazardous materials, beyond the volumes required for operation of the existing structure, may be needed to operate the expanded raised dam structure. Reclamation would update its HMBP and would ensure that its employees follow Cal/EPA and OSHA standards for handling hazardous waste.

In summary, the quantities and types of hazardous materials and possible exposure levels to these materials in the workplace would not pose a significant risk to worker health and safety. Furthermore, there are no known hazardous

waste sites in the primary study area. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-4 (CPI): Expose Sensitive Receptors to Hazardous Materials

Project implementation could expose sensitive receptors to hazardous materials and waste that would be transported through the primary study area. Travel routes to and from the primary study area are limited (i.e., there are few roads); thus, construction traffic would have to use I-5 and local roads, such as Shasta Dam Boulevard and/or Lake Boulevard. A school and park, as well as numerous homes, are located in Shasta Lake City at the intersection of Shasta Dam Boulevard and Lake Boulevard, about 4 miles from Shasta Dam. Project activity would occur while school is in session. The park is open to the public year around. This park is the primary venue for a number of youth and adult sport programs. Although Reclamation would implement measures to lessen the risk of hazardous materials exposure to sensitive receptors, this impact is considered potentially significant.

Aside from scattered residential and recreation areas throughout the primary study area, it does not appear that any other sensitive receptors (e.g., hospitals, schools) in the primary study area would be placed at risk of exposure to hazardous materials as a result of the project. Project implementation would follow local, State, and Federal regulations and procedures regarding the transport of hazardous materials. Mitigation for this impact is proposed in Section 9.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact Haz-5 (CPI): Wildland Fire Risk No new facilities or project construction would occur in the extended study area that would affect the existing potential for wildland fire. Construction materials would be transported and workers would travel to the extended study area from outlying areas via I-5. The potential would exist for truck and vehicular traffic associated with the project to ignite a fire as the result of an accident, a spark, or overheating. However, traffic accidents and fires ignited along roadways typically receive quick local emergency assistance, which includes fire protection. This typical response significantly decreases the potential for a wildland fire being accidentally ignited by project-related traffic. Therefore, this impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-6 (CPI): Release Potentially Hazardous Materials or Hazardous Waste

No new facilities or project construction would occur in the extended study area that would directly or indirectly result in the release of hazardous material or waste. Although hazardous materials used for or generated by the project in the primary study area may be transported through the extended study area, the potential for their release into the environment is less than significant. Hazardous waste generated by the project in the primary study area would likely be disposed of in landfills in the extended study area, and would likely include

utility poles, transformers, asbestos, or lead-based paint. Construction equipment would also generate petroleum product waste. Petroleum products would likely be reclaimed in the primary study area. Other hazardous waste would go to one of three EPA-certified commercial hazardous waste landfills in the state. They are all located in Kings, Kern, and Imperial counties.

Transport of hazardous materials would be conducted in accordance with CCR Title 26 and would be licensed by the CHP, pursuant to California Vehicle Code, Section 32000, which requires proper packaging and licensing by hazardous materials haulers and approved by Caltrans. Highly explosive hazardous waste and large amounts of liquid hazardous waste or are not anticipated to be transported out of the primary study area for disposal. This impacts is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-7 (CPI): Expose Workers to Hazardous Materials Project implementation would not result in new facilities or construction in the extended study area. Workers may be required to transport hazardous materials through the extended study area for project purposes and could be exposed to the materials in the case of an accidental spill. However, hazardous material transport and safety procedures for hazardous material transported through the extended study area would be sufficient to minimize risks to workers. Workers involved in hazardous waste disposal activities would follow Cal/EPA and OSHA hazardous material and waste handling rules and regulations. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-8 (CPI): Expose Sensitive Receptors to Hazardous Materials or Hazardous Waste No new facilities or project construction would occur in the extended study area that would directly or indirectly result in the exposure of sensitive receptors to hazardous materials or hazardous waste. Therefore, this impact is considered less than significant.

Hazardous materials needed for construction or operation of the project and hazardous waste generated in the primary study area would be transported through the extended study area. Accidental spills of hazardous materials or waste during transport is possible; however, hazardous waste haulers and hazardous materials suppliers would adhere to all safety precautions and regulations pertaining to hazardous material and hazardous waste transport. These actions would minimize the risk of exposure to hazardous materials or hazardous waste by sensitive receptors in the extended study area. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Haz-1 (CP2): Wildland Fire Risk This impact would be similar to Impact Haz-1 (CP1) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). Activities that could result in wildland fire risks would be the same as those discussed for Impact Haz-1 (CP1). However, the larger inundation area proposed under CP2 would require that more utilities, public service, and recreational facilities to be demolished and relocated than under CP1, and would require more vegetation to be cleared within inundation area. The additional construction and mechanized vegetation clearing associated with CP2 would require prolonged operation of construction equipment in vegetated areas and increase the potential for fire ignition from motor vehicle operation and the presence of charged utility lines in areas with a high fire hazard potential. A proposed increase in the number of campground/day use recreation areas (216 versus 178 for CP1) would increase the potential for wildfire ignition. Therefore, this impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-2 (CP2): Release Potentially Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-2 (CP1) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). However, the amount of potentially hazardous materials required for construction and operation of the project, and the volume of hazardous waste generated by project construction, could be greater for CP2 than for CP1. The number of bridge relocations, aggregate extraction or augmentation actions, and operations and maintenance of CP2 would be similar to those of CP1. Infrastructure relocation actions would require that land- and water- based construction and maintenance equipment operate in and adjacent to Shasta Lake and other potentially sensitive areas. Hazardous materials from leaking equipment, improper handling, or accidental spills could enter the lake, waterways, or adjacent land. Also under CP2, nine gas/petroleum tanks would be excavated and relocated to avoid inundation. Therefore, this impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-3 (CP2): Expose Workers to Hazardous Materials This impact would be similar to Impact Haz-3 (CP1) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). CP2 would require the use of potentially hazardous materials during construction, operation, and maintenance of the project. The larger scale of CP2 compared to CP1 would also generate a larger volume of hazardous waste resulting from utility line and infrastructure demolition. However, workers involved in hazardous waste disposal activities would follow Cal/EPA and OSHA hazardous material and waste handling rules and regulations. This impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-4 (CP2): Expose Sensitive Receptors to Hazardous Materials This impact would be similar to Impact Haz-4 (CP1) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). Project implementation could expose sensitive receptors to hazardous materials and waste that would be transported through the primary study area. Travel routes to and from the primary study area are limited (i.e., there are few roads); thus, construction traffic would have to use I-5 and local roads, such as Shasta Dam Boulevard and/or Lake Boulevard. A school and park, as well as numerous homes are located in Shasta Lake City at the intersection of Shasta Dam Boulevard and Lake Boulevard, about 4 miles from Shasta Dam. Although the scale of project actions proposed under CP2 would be larger than that of CP1, the primary study area would remain the same. Therefore, this impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact Haz-5 (CP2): Wildland Fire Risk This impact would be similar to Haz-5 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would affect the existing potential for wildland fire. The potential for an increased risk of fire resulting from haul trucks associated with the project would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-6 (CP2): Release Potentially Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-6 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would result in the direct or indirect release of hazardous material or waste. The potential for an increased risk of hazardous materials spills resulting from haul trucks associated with the project would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-7 (CP2): Expose Workers to Hazardous Materials This impact would be similar to Impact Haz-7 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. Project implementation would not result in new facilities or construction in the extended study area. Workers involved in hazardous waste disposal activities would follow Cal/EPA and OSHA hazardous material and waste handling rules and regulations. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-8 (CP2): Expose Sensitive Receptors to Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-8 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that

would result in the direct or indirect exposure of sensitive receptors to hazardous materials or hazardous waste. The potential for the exposure of sensitive receptors to hazard materials or waste associated with the project would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Haz-1 (CP3): Wildland Fire Risk This impact would be similar to Impact Haz-1 (CP1) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). However, the larger inundation area proposed under CP2 would require that more utilities, public service, and recreational facilities to be demolished and relocated than under CP1, and would require more vegetation to be cleared within inundation area. The larger scale of utility line and road construction, and the vegetation clearing and grubbing associated with CP3, would require prolonged operation of construction equipment in vegetated areas and increase the potential for fire ignition that comes from motor vehicle operation and the presence of charged utility lines in areas with a high fire hazard potential. A proposed increase in the number of campground/day use recreation areas (254 versus 178 (CP1) or 216 (CP2)) would also increase the potential for wildfire ignition. This impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-2 (CP3): Release Potentially Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-2 (CP1) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). However, the amount of potentially hazardous materials required for construction and operation of the project and the volume of hazardous waste generated by project construction could be greater for CP3 than either CP1 or CP2. The number of bridge relocations, aggregate extraction or augmentation actions, and operations and maintenance of CP3 would be similar to those of CP1 and CP2. However, infrastructure relocation actions would require that land- and water-based construction and maintenance equipment operate in and adjacent to Shasta Lake and other potentially sensitive areas. Hazardous materials from leaking equipment, improper handling, or accidental spills could enter the lake, waterways, or adjacent land. Under CP3, nine gas/petroleum tanks would be excavated and relocated to avoid inundation. This impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-3 (CP3): Expose Workers to Hazardous Materials This impact would be similar to Impact Haz-3 (CP1) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). CP3 would require the use of potentially hazardous materials during construction, operation, and maintenance of the project. The larger scale of CP3 compared to CP1 or CP2

would also generate a larger volume of hazardous waste resulting from utility line demolition. However, workers involved in hazardous waste disposal activities would follow Cal/EPA and OSHA hazardous material and waste handling rules and regulations. Therefore, this impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-4 (CP3): Expose Sensitive Receptors to Hazardous Materials This impact would be similar to Impact Haz-4 (CP1) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). Project implementation could expose sensitive receptors to hazardous materials and waste that would be transported through the primary study area. Travel routes to and from the primary study area are limited (i.e., there are few roads); thus, construction traffic would have to use I-5 and local roads, such as Shasta Dam Boulevard and/or Lake Street. A school and park, as well as numerous homes, are located in Shasta Lake City at the intersection of Shasta Dam Boulevard and Lake Boulevard, about 4 miles from Shasta Dam. Although the scale of project actions proposed under CP3 would be larger than that of CP1 or CP2, the primary study area would remain the same. Therefore, this impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact Haz-5 (CP3): Wildland Fire Risk This impact would be similar to Haz-5 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would affect the existing potential for wildland fire. The potential for an increased risk of fire resulting from haul trucks and construction traffic associated with the project would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-6 (CP3): Release Potentially Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-6 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would result in the direct or indirect release of hazardous material or waste. The potential for an increased risk of hazardous materials spills resulting from haul trucks associated with the project would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-7 (CP3): Expose Workers to Hazardous Materials This impact would be similar to Impact Haz-7 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. Project implementation would not result in new facilities or construction in the extended study area. Workers involved in hazardous waste disposal activities would follow Cal/EPA and OSHA hazardous material and waste handling rules and regulations. Therefore, this impact is considered less than significant.

Impact Haz-8 (CP3): Expose Sensitive Receptors to Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-8 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would result in the direct or indirect exposure of sensitive receptors to hazardous materials or hazardous waste. The potential for the exposure of sensitive receptors to hazardous materials or waste associated with the project would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus with Water Supply Reliability

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Haz-1 (CP4): Wildland Fire Risk This impact would be similar to Impact Haz-1 (CP3), except that vehicles and equipment involved in the gravel augmentation activities and Reading Island habitat restoration project along the upper Sacramento River would slightly increase the potential for wildland fires. This impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-2 (CP4): Release Potentially Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-2 (CP3), except that vehicles and equipment involved in the gravel augmentation activities and Reading Island habitat restoration project along the upper Sacramento River would slightly increase the potential for release of hazardous materials or waste.

Under CP4, the major components described for CP3 would be implemented, but the project focus would be on increasing habitat for anadromous fish. Gravel may be augmented at points along the Sacramento River downstream from Shasta Dam to create fish habitat. Aggregate extraction and/or augmentation activities under CP4 could release hazardous substances (e.g., mercury) entrained in these gravels into the water. Also, gravel augmentation and the Reading Island habitat restoration project could cause hazardous materials from leaking equipment, improper handling, or accidental spills could enter nearby waterways or adjacent land. This impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-3 (CP4): Expose Workers to Hazardous Materials This impact would be similar to Impact Haz-3 (CP3), except that gravel augmentation activities and the Reading Island habitat restoration project along the upper Sacramento River would slightly increase the potential for the exposure of workers to hazardous materials or hazardous waste. This impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-4 (CP4): Expose Sensitive Receptors to Hazardous Materials This impact would be similar to Impact Haz-4 (CP1) and similar to Impact Haz-4 (CP3) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). Under CP4, the major components described for CP3 would be implemented, but the project focus would be on increasing habitat for anadromous fish. No additional actions are proposed that would affect the potential for the exposure of sensitive receptors to hazardous materials or hazardous waste. This impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact Haz-5 (CP4): Wildland Fire Risk This impact would be similar to Haz-5 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would affect the existing potential for wildland fire. The potential for an increased risk of fire resulting from haul trucks or construction traffic associated with the project would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-6 (CP4): Release Potentially Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-6 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would result in the direct or indirect release of hazardous material or waste. The potential for an increased risk of hazardous materials spills resulting from haul trucks associated with the project would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-7 (CP4): Expose Workers to Hazardous Materials This impact would be similar to Impact Haz-7 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. Project implementation would not result in new facilities or construction in the extended study area. Workers involved in hazardous waste disposal activities would follow Cal/EPA and OSHA hazardous material and waste handling rules and regulations. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-8 (CP4): Expose Sensitive Receptors to Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-8 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would result in the direct or indirect exposure of sensitive receptors to hazardous materials or hazardous waste. The potential for the exposure of sensitive receptors to hazard materials or waste associated with the project

would be negligible. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

CP5 – 18.5-Foot Dam Raise, Combination Plan

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Haz-1 (CP5): Wildland Fire Risk This impact would be similar to Impact Haz-1 (CP4) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). This impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-2 (CP5): Release Potentially Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-2 (CP4) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). Under CP5, the major components described for CP3 would be implemented, but as described under CP4, the project focus would be a combination of increasing water supply availability, enhancing environmental resources in the primary study area, and maintaining the existing level of recreational opportunities. No additional actions are proposed that would affect the potential for the release of hazardous materials or hazardous waste. This impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Impact Haz-3 (CP5): Expose Workers to Hazardous Materials This impact would be similar to Impact Haz-3 (CP3) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). Under CP5, the major components described for CP3 would be implemented, but the project focus would be a combination of increasing water supply availability, enhancing environmental resources in the primary study area, and maintaining the existing level of recreational opportunities. No additional actions are proposed that would affect the potential for the exposure of workers to hazardous materials or hazardous waste. This impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-4 (CP5): Expose Sensitive Receptors to Hazardous Materials This impact would be similar to Impact Haz-4 (CP3) for Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). Under CP5, the major components described for CP3 would be implemented, but the project focus would be a combination of increasing water supply availability, enhancing environmental resources in the primary study area, and maintaining the existing level of recreational opportunities. No additional actions are proposed that would affect the potential for the exposure of sensitive receptors to hazardous materials or hazardous waste. This impact is considered potentially significant. Mitigation for this impact is proposed in Section 9.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact Haz-5 (CP5): Wildland Fire Risk This impact would be similar to Haz-5 (CP1) for the lower Sacramento River and Delta and the CVP/SWP

service areas. No new facilities or project construction would occur in the extended study area that would affect the existing potential for wildland fire. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-6 (CP5): Release Potentially Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-6 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would result in the direct or indirect release of hazardous material or waste. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact Haz-7 (CP5): Expose Workers to Hazardous Materials This impact would be similar to Impact Haz-7 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. Project implementation would not result in new facilities or construction in the extended study area. Therefore, this impact is considered less than significant.

Impact Haz-8 (CP5): Expose Sensitive Receptors to Hazardous Materials or Hazardous Waste This impact would be similar to Impact Haz-8 (CP1) for the lower Sacramento River and Delta and the CVP/SWP service areas. No new facilities or project construction would occur in the extended study area that would result in the direct or indirect exposure of sensitive receptors to hazardous materials or hazardous waste. Therefore, this impact is considered less than significant. Mitigation for this impact is not needed, and thus not proposed.

9.3.5 Mitigation Measures

Table 9-1 presents a summary of mitigation measures for hazards and hazardous materials and waste.

Table 9-1. Summary of Mitigation Measures for Hazards and Hazardous Materials and Waste

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact Haz-1: Wildland Fire Risk (Shasta Lake and Vicinity and Upper Sacramento River)	LOS before Mitigation	NI	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	Haz-1: Coordinate and Assist Public Services Agencies to Reduce Fire Hazards.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS
Impact Haz-2: Release Potentially Hazardous Materials or Hazardous Waste (Shasta Lake and Vicinity and Upper Sacramento River)	LOS before Mitigation	NI	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	Haz-2: Reduce Potential for Release of Hazardous Materials and Waste.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS
Impact Haz-3: Expose Workers to Hazardous Materials (Shasta Lake and Vicinity and Upper Sacramento River)	LOS before Mitigation	NI	LTS	LTS	LTS	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS
Impact Haz-4: Expose Sensitive Receptors to Hazardous Materials (Shasta Lake and Vicinity and Upper Sacramento River)	LOS before Mitigation	NI	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	Haz-4: Reduce Potential for Exposure of Sensitive Receptors to Hazardous Materials or Waste.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS
Impact Haz-5: Wildland Fire Risk (Lower Sacramento River, Delta, CVP/SWP Service Areas)	LOS before Mitigation	NI	LTS	LTS	LTS	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS
Impact Haz-6: Release Potentially Hazardous Materials or Hazardous Waste (Lower Sacramento River, Delta, CVP/SWP Service Areas)	LOS before Mitigation	NI	LTS	LTS	LTS	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS
Impact Haz-7: Expose Workers to Hazardous Materials (Lower Sacramento River, Delta, CVP/SWP Service Areas)	LOS before Mitigation	NI	LTS	LTS	LTS	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS
Impact Haz-8: Expose Sensitive Receptors to Hazardous Materials (Lower Sacramento River, Delta, CVP/SWP Service Areas)	LOS before Mitigation	NI	LTS	LTS	LTS	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS

Notes:

LOS = level of significance

LTS = less than significant

NI = no impact

PS = potentially significant

No-Action Alternative

No mitigation measures are required for this alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is required for Impacts Haz-3, or Impacts Haz-5 through Haz-8. Mitigation is provided below for other impacts of CP1 on hazards and hazardous materials. Mitigation is provided for the wildland fire hazard, the risk of hazardous material or hazardous waste releases, and the risk of exposing sensitive receptors to hazardous materials.

Mitigation Measure Haz-1 (CP1): Coordinate and Assist Public Services Agencies to Reduce Fire Hazards Reclamation will coordinate all proposed road closures, detours, and traffic control measures with SCSO and Tehama County Sheriff's Office, which are the designated OES for the primary study area.

Reclamation will also coordinate all proposed road closures, detours, and traffic control measures with USFS, Caltrans, CHP, the City of Shasta Lake, and the surrounding Shasta Lake communities.

Reclamation will appoint a public liaison to communicate construction schedules, road closures, and project activities with the public. The liaison will organize and conduct public meetings for communicating project information. The liaison will meet with all affected public services agencies to coordinate public meetings and information exchanges.

Reclamation will meet with public services agencies to determine that traffic controls for infrastructure, utility, and structure relocation do not impede emergency access for wildland fire response capabilities.

Reclamation will require that all project workers receive fire prevention safety training, which identifies local wildland fire hazards and informs workers of the relevant fire prevention procedures, rules, and regulations.

Implementation of this mitigation measure will reduce Impact Haz-1 (CP1) to less than significant.

Mitigation Measure Haz-2 (CP1): Reduce Potential for Release of Hazardous Materials and Waste Reclamation will update the Shasta Dam facilities HMBP (or like document). The update will provide information regarding the hazardous materials used for project implementation and hazardous waste that would be generated.

Reclamation will coordinate hazardous materials and waste information with SCSO and the Tehama County Sheriff's Office (the designated OES for the primary study area), USFS, the City of Shasta Lake, and the surrounding Shasta Lake communities. Transportation coordination efforts will also include CHP

and Caltrans, and will include disclosing and planning proposed hazardous material transportation routes to ensure use of the route(s) having the least impact.

Reclamation will appoint a public liaison to communicate hazardous material transportation routes related to project activities with the public. The liaison will organize and conduct public meetings, which will include discussions of hazardous waste transport in the primary and extended study areas. The liaison will meet with all affected public services agencies to coordinate public meetings and information exchanges.

Project workers who may come into contact with hazardous materials or waste will be required to receive hazardous material safety training, which identifies hazardous materials on the project site and informs workers of the relevant safety procedures, rules, and regulations that address hazardous waste handling, storage, and transportation.

Reclamation will ensure that project construction sites have staging areas that minimize potential hazardous waste releases and that meet best management practices for short-term construction site hazardous material storage.

Implementation of this mitigation measure will reduce Impact Haz-2 (CP1) to less than significant.

Mitigation Measure Haz-4 (CP1): Reduce Potential for Exposure of Sensitive Receptors to Hazardous Materials or Waste Reclamation will coordinate hazardous materials transportation routes with the SCSO and the Tehama County Sheriff's Office, which are the designated OES for the primary study area, USFS, Caltrans, CHP, the City of Shasta Lake, a representative from the Shasta Lake elementary school, and each county OES office that would be affected in the primary and extended study areas. Coordination efforts will include disclosing and planning proposed hazardous material transportation routes and schedules to allow for site-specific modifications that would lessen the potential impact on sensitive receptors.

Reclamation will appoint a public liaison to communicate hazardous material transportation routes related to project activities with the public. The liaison will organize and conduct public meetings, which will include a discussion of hazardous waste transport near local sensitive receptors. The liaison will meet with all affected public services agencies to coordinate public meetings and information exchanges.

Reclamation will identify sensitive receptor sites for all project workers who would use, handle, or transport hazardous materials, and require workers transporting hazardous materials past the sensitive receptors to proceed with extreme caution.

Reclamation will place road signs identifying sensitive receptor sites for hazardous material haulers and post reduced speed limits if local jurisdictions find it necessary to prevent potential impacts.

Implementation of this mitigation measure will reduce Impact Haz-4 (CP1) to less than significant.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is required for Impacts Haz-3, or Impacts Haz-5 through Haz-8. Mitigation is provided below for other impacts of CP2 on hazards and hazardous materials. Mitigation is provided for the wildland fire hazard, the risk of hazardous material or hazardous waste releases, and the risk of exposing sensitive receptors to hazardous materials.

Mitigation Measure Haz-1 (CP2): Coordinate and Assist Public Services Agencies to Reduce Fire Hazards This mitigation measure is identical to Mitigation Measure Haz-1 (CP1). Implementation of this mitigation measure will reduce Impact Haz-1 (CP2) to less than significant.

Mitigation Measure Haz-2 (CP2): Reduce Potential for Release of Hazardous Materials and Waste This mitigation measure is identical to Mitigation Measure Haz-2 (CP1). Implementation of this mitigation measure will reduce Impact Haz-2 (CP2) to less than significant.

Mitigation Measure Haz-4 (CP2): Reduce Potential for Exposure of Sensitive Receptors to Hazardous Materials or Waste This mitigation measure is identical to Mitigation Measure Haz-4 (CP1). Implementation of this mitigation measure will reduce Impact Haz-4 (CP2) to less than significant.

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is required for Impacts Haz-3, or Impacts Haz-5 through Haz-8. Mitigation is provided below for other impacts of CP3 on hazards and hazardous materials. Mitigation is provided for the wildland fire hazard, the risk of hazardous material or hazardous waste releases, and the risk of exposing sensitive receptors to hazardous materials.

Mitigation Measure Haz-1 (CP3): Coordinate and Assist Public Services Agencies to Reduce Fire Hazards This mitigation measure is identical to Mitigation Measure Haz-1 (CP1). Implementation of this mitigation measure will reduce Impact Haz-1 (CP3) to less than significant.

Mitigation Measure Haz-2 (CP3): Reduce Potential for Release of Hazardous Materials and Waste This mitigation measure is identical to Mitigation Measure Haz-2 (CP1). Implementation of this mitigation measure will reduce Impact Haz-2 (CP3) to less than significant.

Mitigation Measure Haz-4 (CP3): Reduce Potential for Exposure of Sensitive Receptors to Hazardous Materials or Waste This mitigation measure is identical to Mitigation Measure Haz-4 (CP1). Implementation of this mitigation measure will reduce Impact Haz-4 (CP3) to less than significant.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus with Water Supply Reliability

No mitigation is required for Impacts Haz-3, or Impacts Haz-5 through Haz-8. Mitigation is provided below for other impacts of CP2 on hazards and hazardous materials. Mitigation is provided for the wildland fire hazard, the risk of hazardous material or hazardous waste releases, and the risk of exposing sensitive receptors to hazardous materials.

Mitigation Measure Haz-1 (CP4): Coordinate and Assist Public Services Agencies to Reduce Fire Hazards This mitigation measure is identical to Mitigation Measure Haz-1 (CP1). Implementation of this mitigation measure will reduce Impact Haz-1 (CP4) to less than significant.

Mitigation Measure Haz-2 (CP4): Reduce Potential for Release of Hazardous Materials and Waste This mitigation measure is identical to Mitigation Measure Haz-2 (CP1). Implementation of this mitigation measure will reduce Impact Haz-2 (CP4) to less than significant.

Mitigation Measure Haz-4 (CP4): Reduce Potential for Exposure of Sensitive Receptors to Hazardous Materials or Waste This mitigation measure is identical to Mitigation Measure Haz-4 (CP1). Implementation of this mitigation measure will reduce Impact Haz-4 (CP4) to less than significant.

CP5 – 18.5-Foot Dam Raise, Combination Plan

No mitigation is required for Impacts Haz-3, or Impacts Haz-5 through Haz-8. Mitigation is provided below for other impacts of CP2 on hazards and hazardous materials. Mitigation is provided for the wildland fire hazard, the risk of hazardous material or hazardous waste releases, and the risk of exposing sensitive receptors to hazardous materials.

Mitigation Measure Haz-1 (CP5): Coordinate and Assist Public Services Agencies to Reduce Fire Hazards This mitigation measure is identical to Mitigation Measure Haz-1 (CP1). Implementation of this mitigation measure will reduce Impact Haz-1 (CP5) to less than significant.

Mitigation Measure Haz-2 (CP5): Reduce Potential for Release of Hazardous Materials and Waste This mitigation measure is identical to Mitigation Measure Haz-2 (CP1). Implementation of this mitigation measure will reduce Impact Haz-2 (CP5) to less than significant.

Mitigation Measure Haz-4 (CP5): Reduce Potential for Exposure of Sensitive Receptors to Hazardous Materials or Waste This mitigation

measure is identical to Mitigation Measure Haz-4 (CP1). Implementation of this mitigation measure will reduce Impact Haz-4 (CP5) to less than significant.

9.3.6 Cumulative Effects

Potentially significant effects were identified in the areas of increased wildland fire risk, accidental releases of hazardous materials or hazardous waste; and potential exposure of sensitive receptors to hazardous materials or hazardous waste. The potential effects would be of greater magnitude and duration with the larger dam raises (i.e., CP3 through CP5 would have greater potential effects than CP1 and CP2).

Reasonably foreseeable actions in the Shasta Lake and vicinity area, such as the construction of Antlers Bridge or the Iron Mountain Mine Restoration Plan, may result in increased potential for wildland fire hazards or accidental releases of hazardous materials or hazardous waste within the primary study area. In addition, as described in the Climate Change Projection Appendix, climate change could result in less precipitation through the 2050s and warmer air temperature, thereby increasing the risk of wildland fire hazard in the vicinity of Shasta Lake.

Implementation of the proposed SLWRI alternatives would result in potentially significant impacts to wildland fire hazards, accidental releases of hazardous materials or hazardous waste, and exposure of sensitive receptors to hazardous materials or hazardous waste. Additive and interactive/multiplicative effects of implementing the proposed SLWRI alternatives with past, present, and reasonably foreseeable probable future projects could result in cumulatively considerable impacts. However, mitigation would be used to reduce impacts associated with the project to a less than significant level. Therefore, the potential for project-related impacts to be cumulatively considerable after mitigation would be less than significant.

The exposure of workers to hazards, hazardous materials, or hazardous waste would not be a cumulatively considerable effect. Implementation of the proposed SLWRI alternatives would not be likely to involve the same workers or occur in the same place or time. Therefore, project implementation would not likely be associated with significant cumulative effects in terms of exposing workers and other sensitive receptors to hazards, hazardous materials, or hazardous waste.

This page left blank intentionally.